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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,834	10/23/2003	Morris Steffin	529742000100	9214

25224 7590 09/20/2006

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EXAMINER	
WANG, CLAIRE X	

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/692,834	STEFFIN, MORRIS	
	Examiner	Art Unit	
	Claire Wang	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/8/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The specification is objected to because of the following informalities:

Page 10, line 7 the word "eybrow" is incorrect.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

3. Claims 21 and 22 recite the limitation "The method" in line 1 of claim 21 and claim 22. There is insufficient antecedent basis for this limitation in the claim. The examiner assumes "method" should have been "apparatus" and will further persecution the examination process according to said assumption.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical

Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1-7, 12-17, 21-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Prokoski (US 7,027,621 B1).

As to claim 1, Prokoski teaches an apparatus for monitoring a biological process (human monitoring; Col. 1 lines 12-15) comprising a processor performing the steps of: receiving image data relating to the biological process (the system is turned on and takes a sequence of images; Col. 7 lines 2-5), said image data corresponding to frames (image frames; Col 7 lines 2-5) comprising a plurality of pixels (pixels per frame; Col. 13 lines 44-47); dividing each frame into a plurality of regions (cells; Fig. 5, Col. 15 lines 1-3) and each region into a plurality of subregions (points; Fig. 6, Col. 15 lines 10-13); filtering pixels in each subregion according to a pixel intensity range to provide a filtered output of pixels (the infrared camera translates the image into levels of gray; Col. 13 lines 44-47); comparing the filtered output of pixels in a first area of each subregion to a second area of each subregion to produce a signal for each subregion (feature extractor; Fig. 15; Col. 23, lines 8-12); transforming each signal according to each signal's current level to produce a transformed output signal for each subregion (position analyzer, Fig. 15); and analyzing the transformed output signals for the plurality of subregions to monitor the biological process (condition assessment, Fig. 15).

As to claim 15, it differs from claim 1 only in that claim 1 is an apparatus claim whereas claim 15 is the method of claim 1. Thus claim 15 is analyzed previously discussed as respect to claim 1.

As to claim 2, Prokoski teaches wherein the biological process is microscopic (micro-movements; Col. 14 lines 2-5).

As to claim 3, Prokoski teaches wherein the biological process is macroscopic (macroscopic means visible to the human eye, all the images captured by the camera can be view by the human eye; Fig. 1).

As to claim 4, Prokoski teaches wherein the macroscopic biological process is drowsiness (fatigue; Col 5 lines 62-63).

As to claim 5, Prokoski teaches wherein the step of receiving image data includes receiving data of facial images of an operator (image sequence of the face of an operator; Col. 6 lines 19-21).

As to claim 6, Prokoski teaches wherein the plurality of regions comprise an eye region (analysis of the eye; Col. 7 lines 63-65), a mouth region (lower mouth; Col. 9 lines 31-33) and a facial boundary region (face; Col. 6 lines 19-21).

As to claim 7, Prokoski teaches the apparatus for monitoring a biological process further comprising a video unit (IR Camera(s); 102, Fig. 15) for acquiring said image data.

As to claim 12, Prokoski teaches wherein the step of analyzing comprises: combining the transformed output signals pursuant to an algorithm to produce a composite measure of the biological process (IR-CMS passively observe, analyze the

driver of a vehicle; Col. 18, lines 9-13); and determining whether the composite measure is below a threshold (eye closures are more than 80%; Col.18, lines 27-28).

As to claim 13, Prokoski teaches the apparatus of claim 12 further comprising sounding an alarm when the composite measure is below the threshold (after analyzing the condition of the driver an audible alert will respond if certain conditions are met; Col. 16 lines 25-26).

As to claim 14, Prokoski teaches the apparatus of claim 12 further comprising generating electrical control signals (the control signal is generated by the IR-CMS, the driver condition monitor and feedback controller) pursuant to an algorithm when the composite measure is below the threshold (after analyzing the condition of the driver an audible alert will respond if certain conditions are met; Col. 16 lines 25-26).

As to claim 16, it differs from claim 5 only in that claim 5 is an apparatus claim whereas claim 16 is the method of claim 5. Thus claim 16 is analyzed previously discussed as respect to claim 5.

As to claim 17, it differs from claim 8 only in that claim 8 is an apparatus claim whereas claim 17 is the method of claim 8. Thus claim 17 is analyzed previously discussed as respect to claim 8.

As to claim 21, Prokoski teaches the apparatus of claim 14 wherein the step of analyzing comprises: combining the transformed output signals pursuant to an algorithm to produce a composite measure of the biological process (IR-CMS passively observe, analyze the driver of a vehicle; Col. 18, lines 9-13); and determining whether the

composite measure is below a threshold (eye closures are more than 80%; Col.18, lines 27-28).

As to claim 22, Prokoski teaches the apparatus of claim 21 further comprising sounding an alarm when the composite measure is below the threshold (after analyzing the condition of the driver an audible alert will respond if certain conditions are met; Col. 16 lines 25-26).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prokoski (US 7,027,621 B1) in view of Yeo (US 6,130,617).

As to claim 8, Prokoski teaches an apparatus for monitoring a biological process (human monitoring; Col. 1 lines 12-15), but does not teach wherein the step of filtering comprises: determining whether a video intensity level of each pixel is within the pixel intensity range; and setting the video intensity level to a predetermined value if the video intensity level is within the range and to another predetermined value if the video intensity level is outside the range to provide the filtered output. Yeo teaches a driver's eye detection methods that uses threshold filtering processing means which takes the gray scaled image intensity and sets the pixels having a black level similar to that of

eyes to "1"s and the other pixels to "0"s (Yeo, Col. 2 lines 24-27). Therefore the black level reads on the claimed "intensity range" and the value of "1" is being assigned to those pixels within the black level or "intensity range"; the value of "0" is being assigned to those pixels outside of the black level or "intensity range" (Yeo, Col. 2 lines 24-27). Thus, it would have been obvious to one ordinarily skilled in the art at the time of the invention was made to combine the threshold filtering process of Yeo with the biological monitoring process of Prokoski to extract the characteristic feature areas from the face image (Col. 2 lines 28-31).

8. Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prokoski (US 7,027,621 B1) in view of Molander (US 2004/0247183 A1)

As to claim 9, Prokoski teaches an apparatus for monitoring a biological process (human monitoring; Col. 1 lines 12-15), but does not teach wherein the step of comparing comprises: configuring the shape of the first area and the shape of the second area for each subregion; evaluating the amount of the filtered output of pixels in the first area and in the second area; determining the difference between the filtered output of pixels in the first area and the second area; and producing the signal based on the step of determining. Molander teaches an eye detection method that uses mask comparison, where a mask is comprised of a circle (Paragraph 37, lines 3-5). The mask moved around to match the best possible candidates for eyes. Each area is filtered with three masks of different sizes and a matching score is given to each match (Paragraph 39, lines 1-6). Therefore the masking comparison reads on the claimed shape

comparison. Thus, it would have been obvious to one ordinarily skilled in the art at the time of the invention to combine the biological monitoring process of Prokoski with the masking technique of Molander in order to achieve better redundancy (Paragraph 39, lines 1-6).

As to claim 18, it differs from claim 9 only in that claim 9 is an apparatus claim whereas claim 18 is the method of claim 9. Thus claim 18 is analyzed previously discussed as respect to claim 9.

9. Claims 10,11, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prokoski (US 7,027,621 B1) in view of Shiffer et al. (US 6,924,832 B1).

As to claim 10, Prokoski teaches an apparatus for monitoring a biological process (human monitoring; Col. 1 lines 12-15), but does not teach wherein the step of transforming comprises: setting the signal for each subregion at a first time as a transformed output signal for each subregion; evaluating whether the level of the signal at a second time is different than the level of the transformed output signal at the first time; and setting a transformed output signal for the second time in accordance with the step of evaluating. Shiffer teaches a method of tracking an object in a video image through means of a motion map. The motion map is generated by comparing the pixels of an object-of-interest of the current frame with the previous frame. The size and the location of the object-of-interest is determined by the combination of the current frame and the previous frame (Shiffer Col. 9, lines 49-53). Thus the motion map of Shiffer

reads on the claimed time transformed output signal over time. Therefore, it would have been obvious to one ordinarily skilled in the art at the time of the invention to combine the biological monitoring process of Prokoski with the motion mapping of Shiffer to indicate pixel motion in the region (Shiffer Col. 9 lines 52-53).

As to claim 11 Prokoski teaches an apparatus for monitoring a biological process (human monitoring; Col. 1 lines 12-15), but does not teach wherein the second step of setting comprises optimizing the transformed output signal for the first time pursuant to an algorithm when the level of the signal at the second time is different than the level of the transformed output signal at the first time and setting the level of the signal at the second time to the optimized level of the signal for the first time. Shiffer teaches a method of tracking an object in a video image through means of a motion map. The motion map is generated by comparing the pixels of an object-of-interest of the current frame with the previous frame. The size and the location of the object-of-interest is determined by the combination of the current frame and the previous frame (Shiffer Col. 9, lines 49-53). Thus the motion map of Shiffer reads on the claimed time transformed output signal over time. Therefore, it would have been obvious to one ordinarily skilled in the art at the time of the invention to combine the biological monitoring process of Prokoski with the motion mapping of Shiffer to indicate pixel motion in the region (Shiffer Col. 9 lines 52-53).

As to claim 19, it differs from claim 10 only in that claim 10 is an apparatus claim whereas claim 19 is the method of claim 10. Thus claim 19 is analyzed previously discussed as respect to claim 10.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Aboutalib et al. (US 5,867,587) teaches of an impaired operator detection and warning system, using eye blink analysis.

Habicht et. al. (US 4,396,903) teaches of an electro-optical system for correlating and integrating image data from frame to frame.

Omry et al. (US 6,756,903 B2) teaches of a driver alertness monitoring system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Claire Wang whose telephone number is 571-270-1051. The examiner can normally be reached on 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7222. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Claire Wang
8/31/2006

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SUPERVISORY PATENT EXAMINER